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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group: 1642
Confirmation No.: 5816
Application No.: 09/822,379
Invention: Method of Treatment Using
Ligand-Immunogen Conjugates
Applicant: Low et al.
Filed: March 30, 2001
Attorney Docket: 3220-67883
Examiner: Karen A. Canella

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450

on 4/22/05


(Signature)

Rebecca L. Ball
(Printed Name)

DECLARATION UNDER 37 C.F.R. § 1.132 OF DR. BARTON A. KAMEN

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I declare as follows:

1. I am currently a Professor of Pediatrics and Pharmacology, Director of Pediatric Hematology-Oncology and Associate Director of the Cancer Institute of New Jersey, University of Medicine and Dentistry of New Jersey. I received a Doctorate of Medicine degree and a Doctorate of Philosophy degree (M.D., Ph.D.) from Case Western Reserve University in 1976. My research has focused on folate and anti-folate metabolism/homeostasis and the function(s) of the folate receptor. I have authored or co-authored more than 150 peer-reviewed journal articles and more than 60 book chapters in the area of my research interests. A copy of my curriculum vitae is attached as Exhibit A.

2. I have read and understand the specification of the captioned application and the pending claims in the application. The pending claims of the captioned patent application are directed to methods and compositions for enhancing an endogenous immune response-mediated elimination of a population of cancer cells comprising administering a composition comprising an immunogen conjugated to a folate receptor-binding ligand and a compound capable of stimulating an endogenous immune response wherein the compound does not bind to the conjugate.

3. An exemplary *in vivo* experiment using the claimed method is shown in Fig. 1 below. Mice (n = 8 mice/group) were preimmunized with an immunogen and were subsequently injected with M109 cancer cells using an intraperitoneal tumor model. The mice were then injected with a conjugate comprising the immunogen linked to a folate receptor-binding ligand. Control mice were injected with PBS. One group of control mice and one group of the mice treated with the conjugate were then treated with cytokines, compounds capable of stimulating an endogenous immune response. The specific method used is described in detail in Example 7 on page 22 of the patent application. Fig. 1 below is analogous to Fig. 7 in the patent application. The results shown in Fig. 1 below demonstrate that the capacity of a folate-immunogen conjugate to promote long-term survival of tumor-bearing mice is strongly synergistic with cytokines, the cytokines alone having a negligible effect on the survival of the mice in the absence of the folate-immunogen conjugate and the folate-immunogen conjugate alone having only a minor effect.

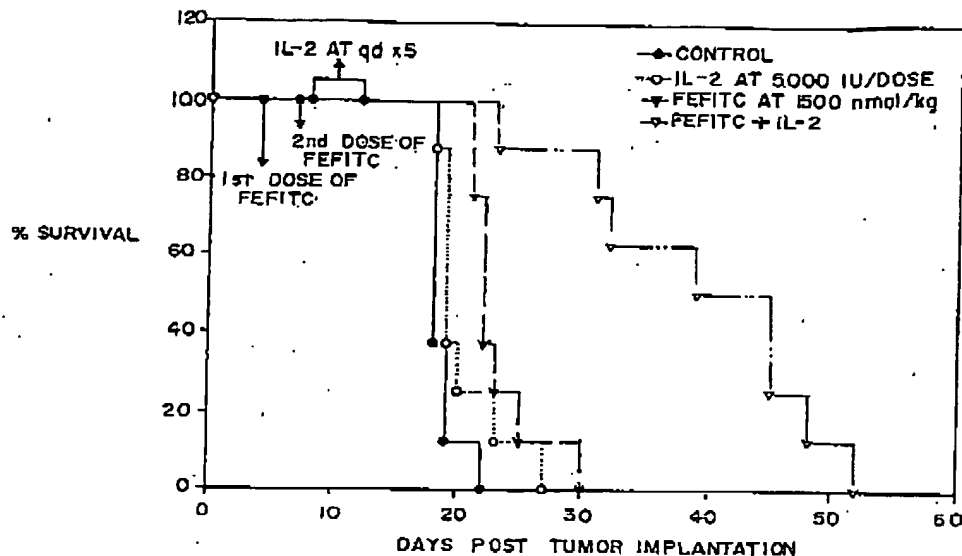
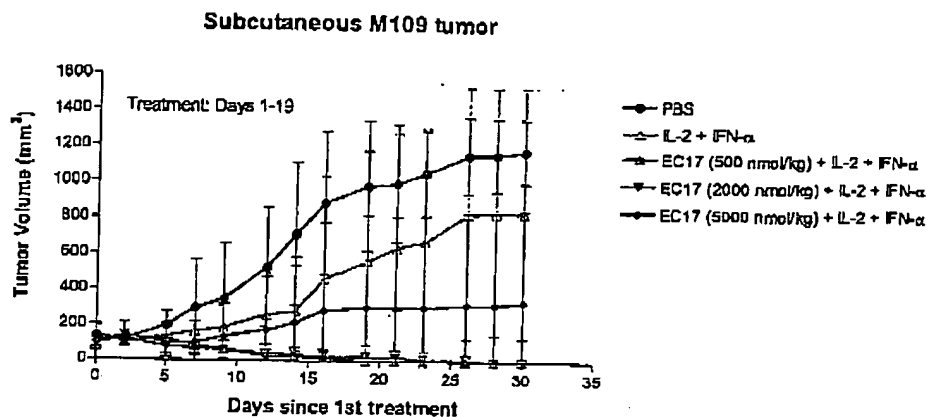


FIG. 1

4. I understand that the licensee of the captioned application is now in Phase I clinical trials with the method described and claimed in the present application as a cancer therapy. I understand that *in vivo* assays have been performed by Dr. Yingjuan Lu, a listed inventor on the captioned application and a research scientist for the licensee, for submission to the FDA in Investigational New Drug Study Reports. These assays utilized an M109 subcutaneous tumor model in Balb/c mice, and compared the effect on tumor volume (mm^3) of a folate-immunogen conjugate (EC17) in combination with cytokines with the effect on tumor volume of cytokines alone. Control mice were injected with PBS. Exemplary data ($n = 8$ mice/group) generated in such an assay are shown below in Fig. 2. I have studied the data shown in Fig. 2. Tumors were implanted 10 days before treatments were initiated (treatments were initiated on day 1 as shown in Fig. 2).



EC17 and IL-2 (20,000 IU/day) were s.c. dosed at 5 times/week for 3 weeks;
 IFN-α (25,000 IU/day) was s.c. dosed at 3 times/week for 3-weeks; N = 8

FIG. 2

5. The data in Fig. 2 show that in animals treated with the compositions and methods described and claimed in the present application, a complete response (*i.e.*, disappearance of the tumor) was observed in up to 100% of the mice. In contrast, in animals treated with cytokines alone, a maximum response of only 25% was observed. I also understand that *in vivo* assays have been performed by Dr. Yingjuan Lu which utilized the same tumor model as used for the assay shown in Fig. 2 and the maximum response observed with EC17 alone was 37.5%.

6. I understand that in the assay shown in Fig. 2, some of the mice that showed a complete response, in the groups treated with EC17 and cytokines, were subsequently used in other assays. All of the remaining mice that showed a complete response, in the groups treated with EC17 and cytokines, were left untreated for a period of 11 months following tumor implantation and no recurrence of disease was observed. These mice were sacrificed after 11 months to make room for other animals in the animal facility.

7. I understand that the effect (*i.e.*, complete tumor disappearance in up to 100% of mice) demonstrated in Fig. 2 is being consistently obtained. These results demonstrate that a complete response (*i.e.*, complete disappearance of tumors) can be obtained in mice with

solid tumors that are treated with folate-immunogen conjugates in combination with cytokines. Cytokines and folate-immunogen conjugates alone each have a considerably reduced effect. A complete response (*i.e.*, complete tumor disappearance) is an unexpected result in the field of cancer therapies utilizing combinations of cancer drugs, particularly where the drugs have never been previously combined.

All statements herein made of my own knowledge are true, and all statements herein made on information and belief are believed to be true; these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code; and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Dated:

4/13/05

By:



Barton A. Kamen, M.D., Ph.D.

INDS02 RVB 670508-1

CURRICULUM VITAE

Name: Barton A. Kamen
Birth date/place: September 30, 1948, New York, NY
Citizenship: U.S. Citizen
Address: 3 Sleepy Hollow Lane
Princeton Junction, NJ 08550
Phone: Home: (609) 936-0660
Work: (732) 235-8864 FAX (732) 235-8234
E-mail kamenba@umdnj.edu
Marital Status: Married 1976, Ruth Saletsky Kamen, Ph.D.
Daughter: Libby, born 9/24/91

EDUCATION

College: Western Reserve University, Cleveland Ohio, 1970, B.A.
Graduate School: Case Western Reserve University, Cleveland, Ohio, 1976,
Ph.D.
Case Western Reserve University, Cleveland, Ohio, 1976,
M.D.

HONORS

Herbert S. Steuer Award for Research in Department of Anatomy,
1976
Alpha Omega Alpha, 1976
Cooley's Anemia Foundation Award (Connecticut), 1978
Damon Runyon/Walter Winchell Cancer Fellowship, 1979-80
Leukemia Society of America Scholar, 1983-87
Burroughs Wellcome Clinical Pharmacology Award, 1987-1992
Founder's Award, Southern Society Pediatric Research, 1989
Student Clinical Teaching Excellence Award, 1991
American Society of Clinical Investigation, 1992
Carl B. and Florence E. King Distinguished Chair, 1993-
American Cancer Society Clinical Research Professorship, 1994-

EXHIBIT A

BOARD CERTIFICATION/MEMBERSHIPS

American Board of Pediatrics
American Board of Pediatrics (Sub-Board of Hematology/Oncology)
American Association for Cancer Research
Society for Pediatric Research
American Federation of Clinical Research
American Society of Clinical Oncology
Southern Society for Pediatric Research
American Society of Clinical Investigation
American Society Pharmacology and Experimental Therapeutics
American Pediatric Society

PROFESSIONAL TRAINING/POSITIONS

| | |
|---------|--|
| 1976-77 | PL1, Yale University School of Medicine (Pediatric Resident) |
| 1977-78 | PL2, Yale University School of Medicine (Pediatric Resident) |
| 1978-79 | Clinical Fellow Pediatrics, Fellow in Medical Oncology |
| 1979-80 | Damon Runyon/Walter Winchell Cancer Fellow, Department of Pharmacology and Pediatrics, Yale University |
| 1980-83 | Assistant Professor of Pediatrics and Pharmacology, Midwest Children's Cancer Center, Medical College of Wisconsin, Milwaukee Children's Hospital, Milwaukee, Wisconsin |
| 1982-83 | Member, Graduate School Faculty |
| 1983-84 | Associate Professor of Pediatrics and Pharmacology, Midwest Children's Cancer Center, Medical College of Wisconsin, Milwaukee Children's Hospital, Milwaukee, Wisconsin |
| 1984-89 | Associate Professor of Pediatrics and Pharmacology, The University of Texas Southwestern Medical School, Dallas, Texas. |
| 1990-99 | Professor of Pediatrics and Pharmacology, The University of Texas Southwestern Medical Center, Dallas, Texas. |
| 1993-99 | Carl B. and Florence E. King Foundation Distinguished Chair of Pediatric Oncology Research |
| 1994- | American Cancer Society Clinical Research Professor |
| 1999- | Professor of Pediatrics and Pharmacology, Director of Pediatric Hematology-Oncology and Associate Director of the Cancer Institute of New Jersey, University of Medicine and Dentistry of New Jersey Robert Wood Johnson Medical School |
| 1999- | Member Graduate Program in Cellular and Molecular Pharmacology, Robert Wood Johnson Medical School |

COMMITTEES\EDITORIAL RESPONSIBILITIES

| | |
|---------|---|
| 1981- | Pediatric Oncology Group (POG) New Agent and Pharmacology Committee |
| 1981-89 | Pediatric Oncology Group Lymphoid Disease Committee |
| 1981-84 | Chairman Carcinogen Committee The Medical College of Wisconsin |
| 1982-84 | Member, Graduate Faculty The Medical College of Wisconsin |
| 1982-83 | Vice Chairman, New Agent and Pharmacology Committee |
| | Head of New Agent Section, Pediatric Oncology Group |
| 1983-86 | Executive Committee of Hematology/Oncology Discipline Committee Pediatric Oncology Group |
| 1983-87 | Associate Editor, Methotrexate Update |
| 1983-88 | Chairman, New Agent and Pharmacology Committee, Pediatric Oncology Group |
| 1983- | Advisory Board, Who's Who in America (for Cancer Specialists) |
| 1984- | Biohazards Committee |
| 1984-96 | Pharmacy & Therapeutics Committee, Children's Medical Center & Parkland Memorial Hospital |
| 1984-86 | Transfusion Committee, Children's Medical Center |
| 1985- | Head, Pharmacy & Therapeutics, Children's Medical Center |
| 1986- | Director, Intern Selection Committee, Department of Pediatrics, UTSouthwestern Medical Center |
| 1986- | Institutional Review Board for local American Cancer Society |
| 1987- | Editorial Board, Cancer Therapy and Control |
| 1988- | Member Graduate Faculty, UT Southwestern Graduate School of Biomedical Sciences |
| 1989- | Secretary Medical Staff, Children's Medical Center |
| 1990-93 | Scientific Advisory Board - Chemotherapy and Hematology, American Cancer Society (National) |
| 1991- | Advisory Board PDQ (NCI data base for cancer treatment) |
| 1992-93 | Program Planning Committee for the American Society Clinical Oncology for Pediatrics and Pharmacology |
| 1992- | Editorial Board, Cancer Chemotherapy and Pharmacology |
| 1993-94 | Program Committee, AACR |
| 1993- | Associate Editor, Cancer Research Therapy and Control |
| 1993-94 | Chairperson/speaker/program committee, AACR symposium, |
| 1993- | Editorial Board, Pharmacotherapy |
| 1993- | Review Committee Medical Student Basic Science Education |
| 1993- | Search Committee, Chair Dept. of Cell Biology and Neuroscience |
| 1993- | Board of Directors AW Harris Faculty club |

1993- Elected member-at-large of Medical Service, Research and Development plan at UTSouthwestern

1994- Editorial Board, Clinical Cancer Research

1995- Education Committee, AACR meeting 1996

1995-1999 Admissions Committee, MSTP (MD/PhD) program, UTSouthwestern

1995-1997 Search Committee Director of Simmons Cancer Center

1996-1999 Editorial Board, Journal of Clinical Oncology

1996- Board of Directors: Clayton Dabney Foundation for Kids with Cancer

1996- Advisory Group on Research Evaluation and Targeting: American Cancer Society

1996- American Society Clinical Oncology Subcommittee Phase I Clinical Trials

1996- Interim Director, Clinical Research Office, Simmons Cancer Center

1997- Editorial Board, Pediatric Hematology and Oncology

1997- Editorial Board, Cancer Therapeutics

1998- Program committee, AACR Phase I clinical trials

1998- Advisory Committee Burroughs Wellcome Fund Clinical Scientist Awards

1998- Publication Relations and Communications Committee, AACR

1998- Scientific Editor, Pharmacotherapy

1998- Associate Director Simmons Cancer Center (director of exptl therapeutics)

1998- Research Program Evaluation Advisory Group, American Cancer Society

1999- Leukemia and Lymphoma Society of America Translational Research Grant Review Committee

2000- Program Committee AACR and AACR-EORTC joint meeting

AACR program committee and session chair: clinical pharmacology, modality based, invited speaker at mini-symposium.

2001- Chair, American Cancer Society Nominate Peer Reviewers Advisory Group

2001- Editorial Academy, International Journal of Oncology

2002- AACR co-chair of discussion session of gender, age and race in clinical trials, pediatric meet the expert and faculty member of scientist-survivor program (also for 2001 meeting)

2002- Editorial Board of CURE

2002- Selection Committee AACR fellowships

2003- Editorial board, Cancer Therapy

2003 AACR forum chair/speaker - Metronomics

2003 AACR faculty/meeting chair scientist-survivor program

2003 AACR Pediatric Oncology Task Force

2003 Member Institutional Review Board

2003 Committee of Review (faculty review)

2004 AACR co-Chairman, Pediatric Symposium

| | |
|------|--|
| 2004 | Editor-in-Chief Journal of Pediatric Hematology-Oncology |
| 2004 | Editorial Board Current Pediatric Reviews |
| 2004 | Editorial Board Journal of Chemotherapy |
| 2004 | New Jersey Commission on Cancer Research (NJCCR)(one of 11 member board) |

Some Examples of Additional Current and Past "Academic" Activities:

PhD Committee(s): University of Buffalo and Roswell Park Memorial Institute
Reviewer for: Cancer Research, Clinical Cancer Research, Cancer Chemotherapy Pharmacology, Biochemical Pharmacology, Journal Biological Chemistry, Journal Clinical Investigation, Journal Clinical Oncology, Pediatric Hematology/Oncology, Journal National Cancer Institute, Journal Medical and Pediatric Oncology, Pharmacotherapy, New England Journal of Medicine and others.

Ad Hoc Site Visit Cancer and Pharmacology Programs for NIH/NCI and Experimental Therapeutics study section. Special Reviewer for Scientific Advisory Board of St. Jude's Children's Research Hospital. Reviewer for NIH contracts/ grants for Phase I/II drugs and the RAID program for new drug development. Reviewer for American Cancer Society, Special Grants. Board of Trustees, Dallas Chapter Leukemia Society of America. Advisory Board, Komen Foundation (breast cancer research). Board member and President elect, Dallas County Chapter American Cancer Society.

Teaching Responsibilities: Texas: In addition to in patient attending 8-10 weeks/year (pediatric oncology), one day/week was spent in clinic with "routine hematology/oncology and ½ day/week seeing adults in consultation for phase I/II therapy. There was also weekly tumor board. I also lecture third year medical students 6 times/yr about pediatric oncology, teach Anti-Cancer Pharmacology to second year medical students and the advanced pharmacology course for graduate students (mechanisms of drug action) and lecture first year medical students about purine and pyrimidine metabolism. New Jersey: Lecture graduate students and medical students about Pediatric Oncology and Pharmacology. Attending physician approximately 8 weeks/year and weekly clinic. First year biochemistry lecture: clinical correlates of purine and pyrimidine metabolism. Participate in Princeton University undergraduate program for pre-medical students.

Past support (not inclusive of industry, local philanthropy and consulting)

American Cancer Society, DHP68 (originally CH228), A Study of Mechanisms of Resistance and Toxicity to Anti-Folates. **B Kamen PI**, $\approx 30\%$ effort. **1981-1996** \approx \$100,000/yr (terminated by age...rules of ACS).

NIH CA34840, Interaction of Organ Irradiation and Cancer Drug Pharmacology. **B Kamen, John Holcenberg Co-PI 30%**. **4/1/82-3/30/87**. Total direct cost \$541,580.

NIH, CA52625-03, Folate receptor as a marker and target in cancer therapy. **B Kamen, PI, 30% effort. 7/90-6/93**. Total direct costs \$220,000,

NIH, GM43169-01, Molecular cytology of the folate receptor. **Co-PI RGW Anderson, B Kamen, 5% effort. 8/90-7/95**. Total direct cost \$674,000.

NIH, CA33625, Pediatric Oncology Group Activities. **G Buchanan PI. B Kamen 5%. 1/01/93-12/31/93**. Total direct \$189,663.

NIH, CA09640-04, Pediatric Hematology and Oncology research Training Grant. **G Buchanan PI. B Kamen 5%. 03/01/90-02/28/94**, Direct (3/93-2/94) \$131,962.

NIH, UO1 CA60431, Pharmacologic Studies of Acute Lymphoblastic Leukemia. **B Kamen PI, 10% effort, 9/1/93-8/31/97**, Total direct cost \$601,680.

Small grants for therapeutic trials (NIH): A case for aminopterin in the treatment of leukemia. **B Kamen PI, 5% effort, 6/96-5/31/98**. Total direct costs \$101,184.

March of Dimes Birth Defects Foundation: Role of folic acid and homocysteine as risk factors for neural tube defects. **R. Finnell PI. B. Kamen 10%, 6/98-5/2000**, total direct \approx 125,000.

NIH, CA Modulation of drug resistance in CNS tumors. **D. Kokkinakis, PI. B Kamen, 5 % time. 9/98-8/01**. Total direct cost \$345,006

Parker Hughes Trust: A case for aminopterin in the treatment of leukemia. **B. Kamen PI 1/97-12/97**. \$50,000.

Scholar Leukemia Society of America, **B. Kamen PI salary support 1983-1987**, \$30,000/year.

Burroughs Wellcome Clinical Pharmacology Award, **B. Kamen PI salary support 1987-1992**, \$50,000/year

Carl B. and Florence E. King Distinguished Chair in Pediatric Oncology Research, **B. Kamen PI 1993-1999**, \approx 50,000/year.

Texas Dept. of Health. Folate Seroprevalence of Texas Women. **B. Kamen, PI 6/99-01**. Total Direct \approx \$45,000.

HD35396 *Folate receptor knockouts, arsenate and birth defects*. R. Finnell, PI, 4/97-3/02. **B. Kamen, 5% time**. Total direct cost \$789,580.

01-1080-CCR-S-O New Jersey Commission for Cancer Resesarch. *Cerebral folate transport:role in Cancer treatment*. J. Wollack PI, **B. Kamen 5% time**. 6/01-5/03. Total \$97,900, first year \$50,000.

FD-R-001458-NIH, Aminopterin in Adults and Children with Acute Leukemia. **B. Kamen, PI 9/30/00-9/29/03**. Total direct costs \$116,500.

Current:

American Cancer Society Clinical Research Professorship (CRP-6) **B. Kamen, PI Salary Support 1994-** \$60,000/ year.

ACS Supplement to above: \$10,000/yr for supplies or partial student stipend.

FD-R-001832, A Pilot Study of Aminopterin for Patients with Acute Lymphoblastic Leukemia. **B. Kamen, PI 9/30/00-9/29/05**. Total direct cost \$440,000.

New Jersey Commission on Cancer Research: Pilot trial of dextromethorphan in cancer related fatigue. S Goodin PI, **B. Kamen 5% time**. \$35,000 2003-2004

Damon-Runyon Walter Winchell/Eli Lilly Translational Award (mentored research) PI P. Cole, Mentor B. Kamen. 7/03-6/08. total award \$995,000.

NIH R43 CA109801-01: Novel Oral Trojan-Horse Agents For Osteolytic Cancer Goldstein, Alex, S. PI, B. Kamen, 5% time. 9/04-8/06. Total award \$599,998. First year \$299,999.

PATENTS:

Kamen, B.A. and Zebala, J.A. Therapeutic compositions and methods employing aminopterin. U.S. Patent Pending.

Kamen, B. A. Treatment of antifolate neurotoxicity. U.S. Patent Pending.

PUBLICATIONS:

Rothenberg SP, Frances G, and Kamen BA: Antibodies against folic acid— I. *In vitro* biophysical effect. J Lab Clin Med 74:622-671, 1969.

DaCosta M, Rothenberg SP, and Kamen BA: DNA synthesis in chronic granulocytic leukemic cells containing unsaturated folate binder. Blood 39, 621-627, 1972.

Kamen BA, and Caston JD: Direct radiochemical assay for serum folate: competition between ^3H -folic acid and 5-methyltetrahydrofolic acid for a folate binder. J Lab Clin Med 83:164-174, 1974.

Kamen BA and Caston JD: Identification of a folate binder in hog kidney. J Biol Chem 250:2203-2205, 1975.

Kamen BA, Takach PL, Vatev R, and Caston JD: A rapid, radiochemical assay for methotrexate. Anal Biochem 70:54-63, 1976.

Kamen BA and Caston JD: Purification of a folate binding factor in normal human umbilical cord serum. Proc Nat Acad Sci 72:4261-4264, 1975.

Kamen BA and Caston JD: Comments of radiochemical folate assay. Clin Chem 22:1409-1410, 1976.

Kamen BA, Summer CP, and Pearson HA: Exchange transfusion as a treatment for hyperleukocytosis, anemia and metabolic abnormalities in a patient with leukemia. J Pediatr 96:1043-1044, 1980.

Gross S, Kamen BA, Fanaroff A, and Caston JD: Folate compartmentation during developmental maturation. J Pediatr 96:842-844, 1980.

Kamen BA, Cashmore AR, Hsieh P, Dreyer RN, Moroson BA and Bertino JR: Transport of methotrexate in a sensitive and resistant cell line: effect of ³H-methotrexate impurities. J Biol Chem 255:3254-3257, 1980.

Kamen BA, Nylen PA, Camitta BM, and Bertino JR: Methotrexate accumulation in cells as a possible mechanism of chronic toxicity to the drug. Br J Haematol 49:355, 1981.

Krakower GA, Nylen PA, and Kamen BA: Identification and separation of sub-picomole amounts of methotrexate polyglutamates in animal and human biopsy material. Anal Biochem 122:412-416, 1982.

Ohnoshi T, Ohnuma T, Takahashi I, Scanlon K, Kamen BA, Holland JF: Establishment of methotrexate-resistant human acute lymphoblastic leukemia cells in culture and effects of folate antagonists. Cancer Res 42:1655-1660, 1982.

Vietti TJ, Steuber CP, Kim TH, Holcenberg J, Kamen B, Murray E, and Capiello V: Mitoxantrone in children with advanced malignant disease: a phase I study. In, New Anticancer Drugs. Raven Press, New York, NY, 1982.

Kamen BA, Holcenberg JS, Siegel SA: Treatment of CNS leukemia with AZQ. Cancer Treatment Report 66:2105-2106, 1982.

Kamen BA, Whyte-Bauer W and Bertino JR: A mechanism of resistance to Methotrexate. NADPH but not NADH stimulation of methotrexate binding to dihydrofolate reductase. Biochemical Pharmacology 32:1837-1841, 1983.

Harb JM, Werlin SL, Camitta BM, Oechler H, Kamen BA, Blank EL: Hepatic ultrastructure in leukemic children treated with methotrexate and 6-mercaptopurine. Amer J Pediatr Hematol/Oncol 5:323-331, 1983.

Krakower GA and Kamen BA: Comments on pharmacokinetics of erythrocyte and plasma MTX. Cancer Chemother and Pharmacol 10:230, 1983.

Krakower GR, Kamen BA: In situ methotrexate polyglutamate formation in rat tissues. J Pharm Exp Ther 227:633, 1983.

Kamen BA, Eibl B, Cashmore A, Bertino JR: Uptake and efficacy of trimetrexate (TMQ, 2,4, diamino-5 methyl-6-[3,4,5-trimethoxynillinomethyl quinazoline) a non-classical antifolate in MTX resistant leukemia cells in vitro. Biochem Pharmacol 33:1697-1699, 1984.

Kamen BA, Holcenberg JS, Turo K, Whitehead VM: Methotrexate and folate content of erythrocytes in patients receiving oral vs intramuscular therapy with methotrexate. J Pediatr 104:130-133, 1984.

Krakower GR, Kamen BA: The reticulocytic rat: A model for the in situ analysis of methotrexate polyglutamate dynamics. J Pharm Exp Ther 231:43-47, 1984.

Kun LE, Camitta BM, Mulhem RK, Lauer SJ, Kline RW, Casper JT, Kamen BA, Kaplan BM, Barber SW: Treatment of meningeal relapse in childhood acute lymphoblastic leukemia: I. Results of craniospinal irradiation. J Clin Oncol 2:359-364, 1984.

Kamen BA, Holcenberg JS, Moulder JE, Ring BJ, Adams SE, Fish BL: Methotrexate accumulation in rat brain is independent of irradiation and drug schedule. Cancer Res, 44:5092-5094, 1984.

Ohnuma T, Lo RJ, Scanlon K, Kamen BA, Ohnoshi T, Wolman SR, Holland JF: Evolution of methotrexate resistance of human acute lymphoblastic leukemia cells in vitro. Cancer Res 45:1815-1822, 1985.

Civin CI, Krischer J, Land VJ, Nitschke R, Kamen B, Vats T: Pediatric Oncology Group Phase II trial of AMSA in children with solid tumors. Cancer Treat Report 69:335-336, 1985.

Ungerleider RS, Pratt CB, Vietti TJ, Holcenberg JS, Kamen BA, Glaubiger DL, Cohen LF: Phase I trial of mitoxantrone in children. Cancer Treat Rep 69:403-407, 1985.

Kamen BA, Nylen PA, Whitehead VM, Abelson HT, Dolnick BJ, Peterson DW: Lack of dihydrofolate reductase in human tumor and leukemia cells in vivo. Cancer Drug Delivery 2:133-138, 1985.

Kamen BA, Gunther N, Sowinski N, Rizzo J, Marsik F: Analysis of antibiotic stability in a parenteral nutrition solution. J Infec Dis 4:387-389, 1985.

Zimm S, Ettinger L, Holcenberg J, Kamen BA, Vietti TJ, Belasco J, Shutta N, Balis F, Lavi LL, Collins JM, Poplack DG: Phase I and clinical pharmacologic study of mercaptopurine administered as a prolonged intravenous infusion. Cancer Res 45:1869-1873, 1985.

Kamen BA, Gunther N: Daily unit dosing of antibiotics with a programmable, automated syringe pump. Am J Hosp Pharm 42:2715-2716, 1985.

Winick NJ, Krakower G, Kamen BA: Metabolism of MTX to polyglutamyl derivatives and relationship to folate pools in vivo. Proceedings of Second Workshop on Folyl and Anti-Folyl Polyglutamates. Ed. Goldman ID, Praeger Publ. N.Y. pp 297-307, 1985.

Kamen BA and Caston JD: Properties of a folate binding protein (FBP) isolated from porcine kidney. *Biochemical Pharmacol* 35:2323-2329, 1986.

Kamen BA, Capdevilla A: Receptor-mediated folate accumulation is regulated by the cellular folate content. *Proc Natl Acad Sci USA*,83:5983-5987,1986.

Kamen BA, Casper J, Lauer S, Camitta BM, Holcenberg J: Treatment of refractory acute lymphoblastic leukemia with VM-26 and cytosine arabinoside. *Cancer Treat Rep* 70:935-936, 1986.

Kremer JN, Galivan J, Streckfuss A, Kamen BA: Methotrexate metabolism in blood and liver in rheumatoid arthritis: association with hepatic folate deficiency and formation of polyglutamates. *Arth Rheum* 29:832-835, 1986.

Moulder JE, Holcenberg JS, Kamen BA, Cheng M, Fish BL: Renal irradiation and the pharmacology and toxicity of methotrexate and cisplatin. *Int J Radiat Oncol Biol Phys* 12:1415-1418, 1986.

Pratt CB, Kamen BA, Winick N, Sartain P, Champion JE, Ragab AH, Goren MP: Phase I study of iproplatin in pediatric patients: A Pediatric Oncology Group Study. *Cancer Treat Rep* 71:87-88, 1987.

Holcenberg JS, Tutsch KD, Earhart RH, Ungerleider RS, Kamen BA, Pratt CB, Gribble TJ, Glaubiger DL: Phase I study of ICRF 187 in pediatric cancer patients and comparison of its pharmacokinetics in children and adults. *Cancer Treat Rep* 70:703-709, 1986.

Kinney TR, Kirscher JP, Starling KA, Kamen BA: Pediatric Oncology Group Phase II trial of MGBG in children with leukemia and lymphoma. *Cancer Treat Rep* 70:1041-1042, 1986.

Goren MP, Forastiere AA, Wright RK, Horowitz MC, Dodge RK, Kamen BA, Pratt CB: Carboplatin (CBDCA), Iproplatin (CHIP) and high dose cisplatin in hypertonic salt evaluated for tubular nephrotoxicity. *Cancer Chemother Pharmacol* 19:57-60, 1987.

Winick N, Kamen B, Lester C, Balis F, Poplack D, Holcenberg J: Folate and methotrexate polyglutamate tissue levels in monkeys following low dose methotrexate. *Cancer Drug Delivery* 4:25-31, 1987.

Holcenberg JS, Moulder JE, Kamen BA, Krailo MD, Fish BL, Ring BJ, Adams S: Chronic effects of fractionated renal irradiation on the pharmacokinetics of intravenous methotrexate. *Int J Radiat Oncol Biol Phys* 13:759-764, 1987.

Winick NJ, Kamen BA, Streckfuss A, Craig J, McGuirt F, Capizzi RL, Sklar F, Coln D: Methotrexate (MTX) concentration in tumors following low dose MTX. *Cancer Chemotherapy & Pharmacology* 20:78-80, 1987.

Whitehead VM, Kamen BA, Beaulieu D: Levels of dihydrofolate reductase in livers. *Cancer Drug Delivery* 4:185-189, 1987.

Kamen BA, Winick NJ: High dose methotrexate: insecure rationale? *Biochem Pharmacol* 37:2713-2715, 1988.

Kamen BA, Wang MT, Streckfuss AJ, Peryea X, Anderson RGW: Delivery of folates to the cytoplasm of MA104 cells is mediated by a surface membrane receptor that recycles. *J Biol Chem* 263:13602-13609, 1988.

Lacey SW, Sanders JM, Rothberg KG, Anderson RGW, Kamen BA: Complementary DNA for the folate binding protein correctly predicts anchoring to the membrane by glycosyl-phosphatidylinositol. *J Clin Invest* 84:715-720, 1989.

Furman WL, Pratt CB, Rivera GK, Kirscher JP, Kamen BA, Vietti TK: Mortality in pediatric phase I clinical trials. *J Nat'l Canc Inst* 81:1193-1194, 1989.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group: 1642
Confirmation No.: 5816
Application No.: 09/822,379
Invention: Method of Treatment Using
Ligand-Immunogen Conjugates
Applicant: Low et al.
Filed: March 30, 2001
Attorney Docket: 3220-67883
Examiner: Karen A. Canella

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being
deposited with the United States Postal Service with
sufficient postage as first class mail in an envelope
addressed to Commissioner for Patents, P. O. Box
1450, Alexandria, VA 22313-1450

on 4/22/05

Rebecca Ball
(Signature)

Rebecca L. Ball
(Printed Name)

DECLARATION UNDER 37 C.F.R. § 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Philip S. Low, a citizen of the United States of America and resident of West
Lafayette, Indiana, do declare and say that:

I am one of the named inventors on the captioned application for patent filed on
March 30, 2001. The captioned application claims priority to U.S. Patent Application No.
60/193,944, filed on March 31, 2000 and to U.S. Patent Application No. 60/255,846, filed on
December 15, 2000. I understand that the Examiner has rejected claims 43, 45, 46, and 50-52 of
the application under 35 U.S.C. § 103(a) over Cowan (WO 01/32207) in combination with other
references. Cowan was published on May 10, 2001 and has an International Filing Date of
January 19, 2000.

The invention described and claimed in the captioned application was conceived and reduced to practice in this country prior to January 19, 2000.

The invention described and claimed in the captioned application comprises methods and compositions for enhancing an endogenous immune response-mediated elimination of a population of cancer cells comprising administering a composition comprising an immunogen conjugated to a folate receptor-binding ligand and a compound capable of stimulating an endogenous immune response wherein the compound does not bind to the conjugate.

Exhibit A is a copy of a figure that contains the same data as is shown in Fig. 1 of the patent application except that for Fig. 1 in the patent application the assay was extended for a longer period of time (i.e., to about 65 days post tumor implantation). The assay from which the data shown in Exhibit A was obtained was performed in my laboratory by Yingjuan Lu, the other named inventor on the captioned application. The date that the assay depicted in Exhibit A was completed is shown on Exhibit A, but that date has been redacted. The redacted date is earlier than January 19, 2000.

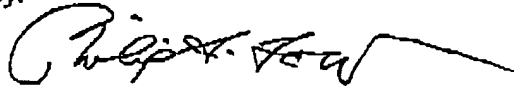
The data in the figure shown in Exhibit A was obtained from an assay in which mice were treated with folate-immunogen conjugates in combination with cytokines. Accordingly, the claimed invention was conceived and reduced to practice in the United States prior to January 19, 2000.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, or any patent issuing thereon.

Dated:

April 7, 2005

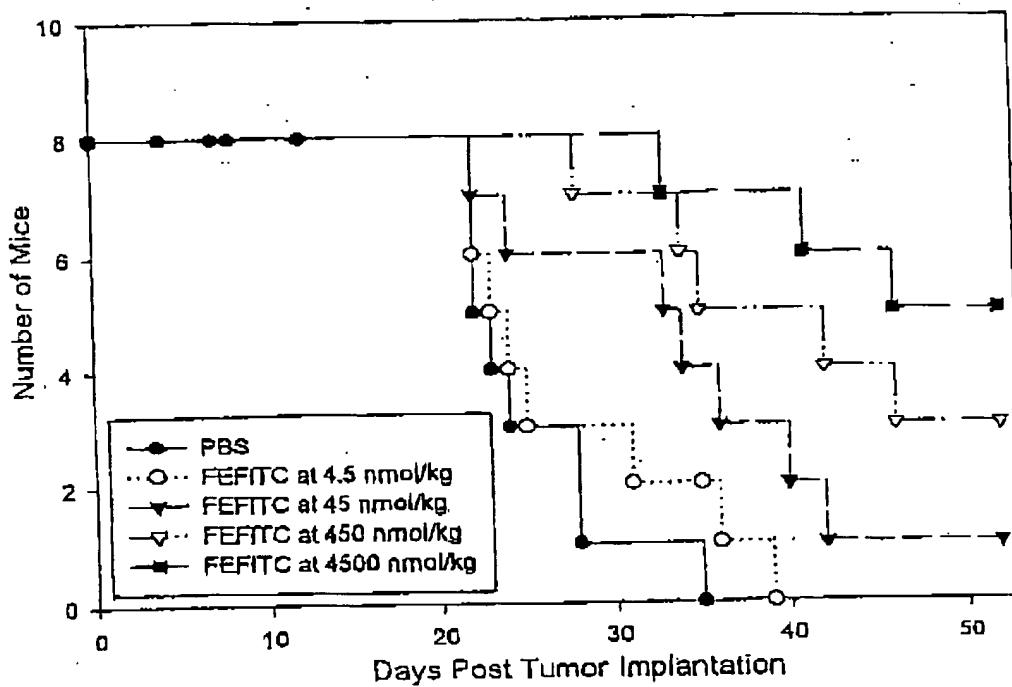
By:



Philip S. Low, Ph.D.

INDS02 RVB 720506-0

Fig. 2



*All mice were implanted with i.p. M109 tumors and treated with same doses of IL-2 at a schedule of qd x 5

EXHIBIT A

to 1.131 Declaration